The Use of Induced Pluripotent Stem Cell Technology to Advance Autism Research and Treatment.

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Public Summary:
Here, we review the literature on the use of stem cells to understand autism spectrum disorders.

Scientific Abstract:
Autism spectrum disorders (ASDs) are a heterogeneous group of neurodevelopmental disorders sharing a core set of symptoms, including impaired social interaction, language deficits, and repetitive behaviors. While ASDs are highly heritable and demonstrate a clear genetic component, the cellular and molecular mechanisms driving ASD etiology remain undefined. The unavailability of live patient-specific neurons has contributed to the difficulty in studying ASD pathophysiology. The recent advent of induced pluripotent stem cells (iPSCs) has provided the ability to generate patient-specific human neurons from somatic cells. The iPSC field has quickly grown, as researchers have demonstrated the utility of this technology to model several diseases, especially neurologic disorders. Here, we review the current literature around using iPSCs to model ASDs, and discuss the notable findings, and the promise and limitations of this technology. The recent report of a nonsyndromic ASD iPSC model and several previous ASD models demonstrating similar results points to the ability of iPSC to reveal potential novel biomarkers and therapeutics.